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Reconnected in file OS 26sep06 15:18:58

File 342:Derwent Patents Citation Indx 1978-05/200656
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      S1      110  CT=(US 4917452 OR US 4473293 OR JP 5133716 OR US 5627669
                   OR JP 5134207 OR US 5627669 OR JP 5134751 OR US 5627669
                   OR WO 200124384 OR US 6320993 OR AU 200129030 OR US
                   6299312 OR US 20020167645)


SYSTEM:OS  - DIALOG OneSearch
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  File 350:Derwent WPIX 1963-2006/UD=200660
         (c) 2006 The Thomson Corporation

Set     Items   Description
S1        155   S1:S28
S2         96   S1 AND (ALIGN????? OR ADJUST????? OR POSITION???)
S3         87   S1 AND (ALIGN????? OR ADJUST????? OR POSITION???)/AB
S4         42   S1 AND (ALIGN?????)/AB
S5          2   S3 AND PHOTOLITHOGRAPH??
S6          0   S3 AND PHOTO () LITHOGRAPH??
S7          2   S1 AND PHOTOLITHOGRAPH??
S8         14   S3 AND WAFER? ?
S9         21   S1 AND CONTROL??? (2N) (SPLITT??? OR PRISM? ? OR MIRROR? ?
             OR REFLECT???)
```

Paul Kim
571-272-8949

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Reconnected in file 2 26sep06 16:36:36

File   2:INSPEC 1898-2006/Sep W3
       (c) 2006 Institution of Electrical Engineers

Set     Items   Description
S1       2168   CONTROL??? (2N) (SPLITT??? OR PRISM? ? OR MIRROR? ? OR REF-
             LECT???)
S2         92   REGULAT???? (2N) (SPLITT??? OR PRISM? ? OR MIRROR? ? OR RE-
             FLECT???)
S3        137   ALTER??? (2N) (SPLITT??? OR PRISM? ? OR MIRROR? ? OR REFLE-
             CT???)
S4         98   MODIFY??? (2N) (SPLITT??? OR PRISM? ? OR MIRROR? ? OR REFL-
             ECT???)
S5        115   GOVERN??? (2N) (SPLITT??? OR PRISM? ? OR MIRROR? ? OR REFL-
             ECT???)
S6        442   S2:S5
S7      93431   MIRROR? ? OR REFLECTOR? ?
S8      13190   MEMS OR (MICROELECTRICAL () MECHANICAL OR MICRO ()ELECTRIC-
             AL () MECHANICAL)
S9     913722   SEMICONDUCTOR? ? OR SUBSTRATE? ? OR WAFER? ?
S10         6   S1 AND S8 AND S9
S11         1   S6 AND S8 AND S9
S12        37   (S1 OR S6) AND S8
S13       695   ADJUST???? (2N) (SPLITT??? OR PRISM? ? OR MIRROR? ? OR REF-
             LECT???)
S14       422   S13 AND S7
S15        27   S14 AND S9
S16         2   S14 AND S8
S17      4222   (TWO OR DUAL OR SECOND OR ANOTHER OR 2ND)(1N) S7
S18       340   S17 AND S9
S19        19   S18 AND ALIGN?????
S20        18   S19 NOT (S15 OR S12)
S21      3620   (TWO OR DUAL OR SECOND OR ANOTHER OR 2ND)(1W) S7
S22       263   S21 AND S9
S23        14   S22 AND ALIGN?????
S24        43   S21 AND (S1 OR S6)
S25         3   S24 AND S9
S26         4   S24 AND LITHOGRAPH????
S27         3   S26 NOT S25
S28      3698   CONTROL??? (4N) (SPLITT??? OR PRISM? ? OR MIRROR? ? OR REF-
             LECT???)
S29       851   (REGULAT???? OR ALTER??? OR MODIFY??? OR GOVERN???) (4N) (-
             SPLITT??? OR PRISM? ? OR MIRROR? ? OR REFLECT???)
S30       433   (S28 OR S29) AND (LITHOGRAPH???? OR SEMICONDUCTOR? ? OR WA-
             FER? ?)
S31        10   S30 AND S17
S32         6   S31 NOT (S26 OR S27 OR S15 OR S12)
S33         0   S24 AND PHOTOLITHOGRAPH????
```

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Tue, 26 Sep 2006, 6:13:11 PM EST

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		Results
#1	((mirror<in>metadata) <and> (photolitho*<in>metadata)) <and> (alignment<in>metadata)	7
#2	((beam splitter<in>metadata) <and> (wafer<in>metadata))	4
#3	((mirror<in>metadata) <and> (lithograph*<in>metadata)) <and> (wafer<in>metadata)	11
#4	((mirror<in>metadata) <and> (lithograph*<in>metadata)) <and> (wafer<in>metadata)	11
#5	((mirror<in>metadata) <and> (lithograph*<in>metadata)) <and> (wafer<in>metadata)	11
#6	((mirror<in>metadata) <and> (controller<in>metadata)) <and> (alignment<in>metadata)	2
#7	((mirror<in>metadata) <and> (controller<in>metadata)) <and> (wafer<in>metadata)	0
#8	(mirror<and>controller)<and>wafer	551
#9	(((mirror<and>controller)<and>wafer)<AND>(lithography<in>metadata))	16
#10	(mirror<and>controller)<and>alignment	691
#11	(((mirror<and>controller)<and>alignment)<AND>(wafer<in>metadata))	15
#12	(((mirror<and>controller)<and>alignment)<AND>(wafer<in>metadata))	15

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L7 ANSWER 5 OF 5 JAPIO
AN 1987-208631 JAPIO
TI REDUCTION TYPE X-RAY LITHOGRAPHY EQUIPMENT
IN SUZUKI SHIGEO
PA SANYO ELECTRIC CO LTD
PI JP 62208631 A 19870912 Showa
AI JP 1986-51033 (JP61051033 Showa) 19860307
PRAI JP 1986-51033 19860307
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1987
IC ICM H01L021-30
ICS G03F007-20

AB PURPOSE: To make it feasible to perform fine processing not exceeding 1μm using existing aligner and stepper by making use of an assymetric Bragg reflection phenomenon of X-rays due to single crystal.
CONSTITUTION: The titled lithgraphy equipment is provided with a monochromator 3 letting X-rays with specified wavelength only pass there-through, the first reflecting mirror 4 reflecting the X-rays from the monochromator 3 in the X direction and the second reflecting mirror 5 reflecting the X-rays reflected by the first mirror in the Y direction while the first and the second reflecting mirrors 4, 5 are composed of assymetric Bragg reflecting mirrors of X-rays due to single crystal. A specified pattern is described in a mask 6 arranged between the monochromator 3 and the first reflecting mirror 4. The pattern described in the mask 6 is not of the same size (1:1) as that of the final exposure pattern but several times larger than that of the same. Finally, an exposure substrate 7 coated with a resist film irradiation-exposed to X-rays transferred through the second reflecting mirror 5 is provided.

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```
L5      ANSWER 1 OF 15  KOREAPAT KIPI on STN
AN      2004:058829   KOREAPAT  ED 20050302
TI      LEVEL SENSOR FOR LITHOGRAPHIC APPARATUS ENABLING APPARENT
        SURFACE DEPRESSION REJECTION
TL      English
IN      TEUNISSEN PAULUS ANTONIUS ANDREAS; BROODBAKKER PETRUS JOHANNES MARIA;
        QUEENS RENE MARINUS GERARDUS JOHAN
PA      ASML NETHERLANDS B.V.
PIT     KRA Unexamined Patent Application
PI      KR 2004065169       A         20040721
AI      KR 2004-2164                  20040113
PRAI    EP 2003-75118                 20030114
IC
ICM     H01L021-027
AB      PURPOSE: A level sensor for a lithographic apparatus is
        provided to reduce or reject an apparent surface depression as well as to
        use the same calibration for all lithographic apparatus having
        difference configuration.
        CONSTITUTION: A level sensor for a lithographic projection
        apparatus includes a light source(S), a first reflector(2), a
        second reflector(4), and a detector(5). The first
        reflector is positioned to direct a light from the light source towards a
        wafer surface. The second reflector is
        positioned to direct the light reflected from the wafer surface
        to the detector. The first and second reflectors are selected to incur a
        minimal process dependent apparent surface depression.
        .COPYRGT. KIPO 2005
```

Paul Kim
571-272-8949

L5 ANSWER 2 OF 15 KOREAPAT KIPI on STN
AN 2003:042618 KOREAPAT ED 20040819
TI DEVICE FOR MEASURING HORIZONTAL AND FOCUSING DISTANCE OF STEREO LITHOGRAPHY APPARATUS
TL English
IN CHO, DONG U; LEE, IN HAN
PA POSTECH FOUNDATION
PIT KRA Unexamined Patent Application
PI KR 2003058443 A 20030707
AI KR 2001-88897 20011231
PRAI KR 2001-88897 * 20011231
IC
ICM G01B011-00
AB PURPOSE: A device for measuring the horizon of an SLA(Stereo Lithography Apparatus) and the height of a photo-resist is provided to measure the height of the photo-resist and the horizon of the SLA by using a semiconductor laser, two reflecting mirrors and an optical detector.

CONSTITUTION: A laser(100) generates light. A first reflecting mirror(110) projects the generated light to a focusing lens(112) vertically. A second reflecting mirror(111) projects the projected light from a focus(114) through the focusing lens horizontally by reflecting through a photo-resist(113) and the focusing lens. An optical detector(116) outputs different electric signals according to the position of the projected light in a detecting unit by dividing more than one detecting units and measures the horizon of the SLA and the height of the photo-resist according to the positions of the projected light. A measuring unit(117) measures the horizon of the SLA and the height of the photo-resist by measuring the electric signals and the strength of the projected light. Thereby, the focusing distance and the horizon are fixed by adjusting the position of the photo-resist according to the exact measurement.

Paul Kim
571-272-8949

L5 ANSWER 13 OF 15 JAPIO
AN 1996-005796 JAPIO
TI X-RAY PROJECTION ALIGNER
IN KATAGIRI SOUICHI; ITO MASAAKI; MATSUZAKA TAKASHI
PA HITACHI LTD
PI JP 08005796 A 19960112 Heisei
AI JP 1994-141728 (JP06141728 Heisei) 19940623
PRAI JP 1994-141728 19940623
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996
IC ICM G21K001-06
ICS G21K005-02; H01L021-027

AB PURPOSE: To provide an X-ray aligner to improve the efficiency of mass production in the semiconductor manufacturing technology (lithography) for copying minute patterns.
CONSTITUTION: A condenser mirror 1 and a mask 2 are laid out in such a configuration as the condenser mirror 1 with a rotary elliptic face is divided into areas 4 and 5 and X rays reflected on the areas 4 and 5 of each rotary elliptic face overlap at the illuminating position of the mask 2 to condense the rays. Therefore, this makes it possible to use a set of two mirrors in an imaging optical system used for an X-ray projection aligner and to make an effective use of illumination light, thereby making an effect for improving the throughput of the aligner. Moreover, it has a secondary effect for making it possible to make incoherent the illumination to improve the quality of images in the imaging optical system.

Paul Kim
571-272-8949

L13 ANSWER 7 OF 10 JAPIO
AN 2001-351855 JAPIO
TI LITHOGRAPHIC PROJECTION APPARATUS AND METHOD FOR MANUFACTURING DEVICE USING IT
IN LOOPSTRA ERIK ROELOF; VAN DIJSSELDONK ANTONIUS JOHANNES J
PA ASM LITHOGRAPHY BV
PI JP 2001351855 A 20011221 Heisei
AI JP 2000-403605 (JP2000403605 Heisei) 20001128
PRAI EP 1999-204043 19991130
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001
IC ICM H01L021-027
ICS G01B021-00; G01B021-22; G02B007-198; G03F009-00

AB PROBLEM TO BE SOLVED: To provide an improved projection apparatus having positioning system capable of accurately arranging a reflective optical element such as a mirror superior as the wavelength of the beam of radiation becomes short and requiring more accurate arrangement than a refracting optical element in terms of convergence and control of beam of radiation of lithographic projection apparatus.
SOLUTION: Position of a mirror 10 in the projected beam PB of radiation is measured by use of absolute position sensors 41 and 42, and then variation of the position is measured by use of relative position sensors 43 and 44. The position of the mirror 10 is controlled by a controller 50 and drive means 30 in accordance with the value measured. The use of both sensors makes the positioning system 20 possible to accurately arrange or stabilize the mirror 10 in failures of redundant calibration or initialization of the mirror 10 to cancel any vibration of the mirror 10.

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L13 ANSWER 9 OF 10 JAPIO
AN 1999-074181 JAPIO
TI X-RAY LITHOGRAPHY DEVICE AND X-RAY ALIGNING METHOD
IN MITSUI SOICHIRO; MUROOKA KENICHI
PA TOSHIBA CORP
PI JP 11074181 A 19990316 Heisei
AI JP 1997-234780 (JP09234780 Heisei) 19970829
PRAI JP 1997-234780 19970829
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999
IC ICM H01L021-027
AB PROBLEM TO BE SOLVED: To enable an image to be corrected for distortions and magnification by a method, wherein an X-ray reflecting drive system is connected to an X-ray reflecting mirror which is so constituted as to very reflection conditions according to an in-plane position, and an X-ray reflecting mirror control system is connected to the X-ray reflecting mirror drive system.
SOLUTION: An X-ray reflecting mirror 805 is connected to an X-ray reflecting mirror drive system 811, which is controlled by an X-ray reflecting mirror control system 810 which controls the orientation and swing of the X-ray reflecting mirror 805 and the position of X-rays incident on the reflecting mirror 805. An X-ray detector 807 measures the parallelism of X-rays reflected from the X-ray reflecting mirror 805 in a horizontal and a vertical direction as two-dimensional data, the X-ray detection signals are inputted into the X-ray reflecting mirror control system 810 to drive the X-ray reflecting mirror 805, and the pattern of an X-ray mask 812 is transferred to an exposure substrate 814. Moreover, the X-ray reflecting mirror 805 is varied in light-reflecting characteristics according to its in-plane 1 position.

L13 ANSWER 5 OF 10 JICST-EPlus
AN 900441141 JICST-EPlus
TI SOR lithography beamline.
AU KANEKO TAKASHI; SAITO YASUNAO; ITABASHI SEIICHI; YOSHIHARA HIDEO
CS NTT LSIKENKYUSHO
SO NTT R D, (1990) vol. 39, no. 4, pp. 573-580. Journal Code: F0137A (Fig. 6, Tbl. 1, Ref. 6)
ISSN: 0915-2326
CY Japan
DT Journal; Article
LA Japanese
STA New
AB This paper presents an efficient beamline for synchrotron radiation(SOR) lithography. It uses two x-ray mirror's to achieve the strong-intensity exposure and the vertical expansion of the exposure area. The first mirror converges SOR beams with a divergence angle of 1.7.DEG.. The second mirror, controlled by a microcomputer, collimates the beams and vibrates to produce an exposure area of 20*20mm. Two x-ray windows of Be and SiN achieve the exposure in a atmospheric environment. (author abst.)
CC BE02020X; NC03030V (621.384.63; 621.382.002.2)
CT synchrotron radiation; light emission; X-ray; lithography; micro circuit technique; beam line; storage ring; optical system; miniaturization; reflectivity
BT bremsstrahlung; electromagnetic wave; wave motion; electromagnetic radiation; radiation; radioactive ray; nonthermal radiation; technology; beam technique; modification; ratio

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25/9/3
DIALOG(R)File 2:INSPEC

05108121 INSPEC Abstract Number: B9204-2550G-134
Title: High efficiency beamline for synchrotron radiation lithography
Author(s): Kaneko, T.; Saitoh, Y.; Itabashi, S.; Yoshihara, H.
Author Affiliation: NTT LSI Lab., Kanagawa, Japan
Journal: Journal of Vacuum Science & Technology B (Microelectronics Processing and Phenomena) vol.9, no.6 p.3214-17
Publication Date: Nov.-Dec. 1991 Country of Publication: USA
CODEN: JVTBD9 ISSN: 0734-211X
U.S. Copyright Clearance Center Code: 0734-211X/91/063214-04$01.00
Conference Title: 35th International Symposium on Electron, Ion and Photon Beams
Conference Sponsor: IEEE; American Vacuum Soc.; Opt. Soc. America
Conference Date: 28-31 May 1991 Conference Location: Seattle, WA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: A highly efficient beamline for synchrotron radiation (SR) lithography has been developed for the compact storage ring (Super-ALIS). **Two** toroidal **mirrors** are employed to increase the X-ray intensity on the **wafer** and to vertically expand the exposure area. Astigmatism is intentionally introduced in these mirrors to increase their converging and collimating abilities. The first mirror converges SR beams with a divergence angle of 2 degrees . The **second mirror** , which is **controlled** by a microcomputer, collimates the beam and oscillates to produce an exposure area of 25*25 mm/sup 2/. An improved vacuum evaporation technique is used to coat the mirror surfaces with platinum, which increases the reflectivity to 50% at a wavelength of 8.34 AA. The resulting X-ray intensity on the **wafer** is 5 mW/cm/sup 2//100 mA. A uniform X-ray intensity distribution can be obtained by adjusting the scan speed of the **second mirror** and using an X-ray compensation filter. The resulting nonuniformity is improved to be less than +or-4%. A reliable X-ray extraction system that consists of two Be windows and a SiN window permits exposure in an atmospheric environment. (9 Refs)
Subfile: B
Descriptors: beam handling equipment; mirrors; storage rings; X-ray lithography; X-ray optics
Identifiers: astigmatism; **two - mirror** optics; X-ray lithography; synchrotron radiation lithography; highly efficient beamline; compact storage ring; Super-ALIS; toroidal mirrors; vacuum evaporation; uniform X-ray intensity distribution; X-ray compensation filter; X-ray extraction system; 8.34 angstrom; Be windows; Pt coating; SiN window
Class Codes: B2550G (Lithography); B7410B (Beam handling and diagnostics) ; B2570 (Semiconductor integrated circuits); B7450 (X-ray and gamma-ray equipment)
Chemical Indexing:
Pt sur - Pt el (Elements - 1)
SiN sur - Si sur - N sur - SiN bin - Si bin - N bin (Elements - 2)
Be sur - Be el (Elements - 1)
Numerical Indexing: wavelength 8.34E-10 m

Paul Kim
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27/9/1
DIALOG(R)File 2:INSPEC

08856288 INSPEC Abstract Number: B2004-03-2550G-082

Title: Development of illumination optics and projection optics for high-NA EUV exposure tool (HiNA)

Author(s): Oshino, T.; Shiraishi, M.; Kandaka, N.; Sugisaki, K.; Kondo, H.; Ota, K.; Mashima, K.; Murakami, K.; Oizumi, H.; Nishiyama, I.; Okazaki, S.

Author Affiliation: Nikon Corp., Kanagawa, Japan

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.5037 p.75-82

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 2003 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

SICI: 0277-786X(2003)5037L.75:DIOP;1-M

Material Identity Number: C574-2003-223

U.S. Copyright Clearance Center Code: 0277-786X/03/$15.00

Conference Title: Emerging Lithographic Technologies VII

Conference Sponsor: SPIE

Conference Date: 25-27 Feb. 2003 Conference Location: Santa Clara, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Applications (A); Experimental (X)

Abstract: We have developed a high numerical aperture (NA) small-field exposure system (HiNA) for EUV exposure process development. NA of projection optics of EUV exposure tools for 45-nm node **lithography** is expected to be around 0.25, which is higher than that previously expected (0.1). HiNA has compatible illumination system, which can be switched to partial coherent illumination and coherent illumination by changing some optical elements. Coherent illumination system was prepared for a high contrast imaging but the uniformity of intensity is less than that of partial coherent illumination. A reflected-type fly's-eye element was adopted for partial coherent illumination, which can provide uniformity of both coherency and intensity simultaneously. The coherency of the partial coherent illumination is 0.8. HiNA projection optics consists of **two** aspheric **mirrors** , with the NA and the imaging field of 0.3 and 0.3*0.5mm/sup 2/, respectively. We fabricated two sets of projection-optics. Although the wavefront error of set-1 optics was 7nmRMS, that of set-2 optics was improved to 1.9nmRMS, which was measured with a point diffraction interferometer (PDI) using He-Ne laser. The wavefront error of the set-2 optics was improved by using a new mirror mount mechanism. The mount system consists of several board springs made of super invar in order to minimize the deformation of mirrors by mounting stress. The projection optics of the set-2 has a remote controlled mirror adjustment mechanism which has five degrees of freedom (X,Y,Z,X-Tilt and Y-Tilt). The position of the concave secondary mirror was adjusted precisely with measuring the wavefront error using PDI. (7 Refs)

27/9/2
DIALOG(R)File 2:INSPEC

04784671 INSPEC Abstract Number: B91001888
Title: SOR lithography **beamline**
Author(s): Kaneko, T.; Saitoh, Y.; Itabashi, S.; Yoshihara, H.
Author Affiliation: NTT, Tokyo, Japan
Journal: NTT Review vol.2, no.4 p.86-91
Publication Date: July 1990 Country of Publication: Japan
CODEN: NTTREK ISSN: 0915-2334
Language: English Document Type: Journal Paper (JP)
Treatment: Applications (A); Practical (P); Experimental (X)
Abstract: Presents an efficient beamline for synchrotron orbital radiation (SOR) **lithography** . It uses two X-ray mirrors to achieve strong-intensity exposure and vertical expansion of the exposure area. The first mirror converges SOR beams with a divergence angle of 1.7 degrees . The **second** **mirror** , **controlled** by a microcomputer, collimates the beams and vibrates to produce an exposure area of 20*20 mm/sup 2/. Two X-ray windows of Be and SiN permit the exposure in an atmospheric environment. (5 Refs)
Subfile: B
Descriptors: beam handling equipment; mirrors; synchrotron radiation; X-ray **lithography** ; X-ray optics
Identifiers: atmospheric environment exposure; SOR **lithography** ; beamline; synchrotron orbital radiation; X-ray mirrors; vertical expansion; SOR beams; divergence angle; exposure area; X-ray windows; Be; SiN
Class Codes: B2550G (Lithography); B7410B (Beam handling)
Chemical Indexing:
Be el (Elements - 1)
SiN bin - Si bin - N bin (Elements - 2)

Paul Kim
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10/9/5
DIALOG(R)File 2:INSPEC

06743163 INSPEC Abstract Number: A9724-4280K-007, B9712-7260-052
Title: Digital micromirror devices make projection displays
Author(s): McDonald, T.G.; Yoder, L.A.
Author Affiliation: Texas Instrum. Inc., Dallas, TX, USA
Journal: Laser Focus World vol.33, no.8 p.SUPL5-8
Publisher: PennWell Publishing,
Publication Date: Aug. 1997 Country of Publication: USA
CODEN: LWFOE8 ISSN: 1043-8092
SICI: 1043-8092(199708)33:8L.supl5:DMDM;1-S
Material Identity Number: M949-97009
Language: English Document Type: Journal Paper (JP)
Treatment: General, Review (G)
Abstract: The digital micromirror device (DMD) is a silicon-based microelectromechanical-system (**MEMS**) reflective spatial light modulator. Each tiny mirror in the array can be independently **controlled** to **reflect** incident light in or out of the collection aperture of a lens. Although the technology has applications as widely varied as pattern recognition and fiber-optic interconnects, TI has chosen the projection-display market for commercial application of the technology. Projection-display systems have been designed that incorporate one, two, or three DMDs. Each approach has inherent performance trade-offs associated with it. In order to understand the trade-offs, a discussion is presented of how a DMD operates and the optical system configuration required for optimal system operation. (4 Refs)
Subfile: A B
Descriptors: display instrumentation; microactuators; mirrors; optical projectors; spatial light modulators
Identifiers: projection displays; digital micromirror device; **MEMS** reflective spatial light modulator; tiny mirror; independently controlled; lens collection aperture; performance trade-offs; optical system configuration; optimal system operation; CMOS **substrate** ; digital light switches; two-chip display
Class Codes: A4280K (Optical beam modulators); A4278M (Eyepieces, projection systems, prism systems); B7260 (Display technology and systems) ; B4150 (Electro-optical devices); B2575 (Micromechanical device technology)

10/9/6
DIALOG(R)File 2:INSPEC

06741154 INSPEC Abstract Number: A9724-4278-004, B9712-4150-025, C9712-3260-007

Title: Scanning and rotating micromirrors using thermal actuators

Author(s): Butler, J.T.; Bright, V.M.; Reid, J.

Author Affiliation: Air Force Inst. of Technol., Wright-Patterson AFB, OH, USA

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3131 p.134-44

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 1997 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

SICI: 0277-786X(1997)3131L.134:SRMU;1-D

Material Identity Number: C574-97203

U.S. Copyright Clearance Center Code: 0277-786X/97/$10.00

Conference Title: Optical Scanning Systems: Design and Applications

Conference Sponsor: SPIE

Conference Date: 30-31 July 1997 Conference Location: San Diego, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Practical (P)

Abstract: Reports on micromachined polysilicon scanning and rotating micromirrors and the development of a CMOS drive system. The micromirrors described in this research were developed at the Air Force Institute of Technology and fabricated using the DARPA-sponsored multi-user **MEMS** processes (MUMPs). The scanning micromirror is connected to the **substrate** using micro-hinges. This allows the mirror plate to rotate off the **substrate** surface and lock into a support mechanism. The angle between the scanning mirror and the **substrate** is modulated by driving the mirror with a thermal actuator array through a range of 20 degrees. For the rotating mirror, the mirror plate is attached to the **substrate** by three floating **substrate** hinges connected to a rotating base. Actuator arrays are also used to position the rotating **mirror** . A computer- **controlled** electrical interface was developed which automates the positioning of both the scanning and rotating mirrors. The low operating voltages of the micromirror positioning mechanism makes the use of CMOS technology attractive; and the development of a digital interface allows for flexible operation of the devices. These designs are well suited for micro-optical applications such as optical scanners, corner cube reflectors, and optical couplers where electrical positioning of a mirror is desired. (8 Refs)

Subfile: A B C

Descriptors: actuators; CMOS integrated circuits; computerised control; electro-optical deflectors; micromachining; micromechanical devices; mirrors; optical couplers; optical scanners; position control

Identifiers: scanning micromirrors; rotating micromirrors; thermal actuator array; CMOS drive system; multi-user **MEMS** processes; microelectromechanical systems; micro-hinges; support mechanism; floating **substrate** hinges; computer-controlled electrical interface; position control; operating voltage; micromirror positioning mechanism; digital interface; micro-optical applications; optical scanners; corner cube reflectors; optical couplers; electrical positioning

Paul Kim
571-272-8949

12/9/27
DIALOG(R)File 2:INSPEC

08160538 INSPEC Abstract Number: A2002-05-0660-001, B2002-02-8380M-015, C2002-02-3260P-019

Title: Hexapod parallel kinematics with sub-micrometer accuracy

Author(s): Gloess, R.

Conference Title: ACTUATOR 2000. 7th International Conference on New Actuators and International Exhibition on Smart Actuators and Drive Systems. Conference Proceedings p.293-5

Editor(s): Borgmann, H.

Publisher: MESSE BREMEN GMBH, Bremen, Germany
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Conference Title: Proceedings of 7th International Conference on New Actuators - ACTUATOR 2000

Conference Date: 19-21 June 2000 Conference Location: Bremen, Germany

Language: English Document Type: Conference Paper (PA)

Treatment: Applications (A); Practical (P)

Abstract: PI's hexapod parallel kinematic structures have been employed in ultra-precise positioning and alignment applications for almost ten years. Examples are precision alignment of satellite antennas, **control** of secondary **mirrors** (astronomical telescopes) and industrial handling and micromachining systems. Assembly and manufacture of micro optical devices (wave guides, laser chips) and micromechanics such as **MEMS** require ultra-precise handling mechanisms with sub-micron resolution and motion in six degrees of freedom. For alignment purposes the motion should also be free of backlash. (3 Refs)

Subfile: A B C

Descriptors: astronomical telescopes; manipulator kinematics; micro-optics; microactuators; microassembling; micromachining; micromanipulators; micropositioning; mirrors; optical control; satellite antennas

Identifiers: hexapod parallel kinematic structures; ultraprecise positioning; ultraprecise alignment; submicrometer accuracy; satellite antennas; secondary mirrors; astronomical telescopes; industrial handling; micromachining systems; micro optical devices; laser chips; **MEMS** ; flexure joint; six degrees of freedom; high resolution; high stiffness; linear positioning; micromanipulator

Class Codes: A0660S (Positioning and alignment; manipulating, remote handling); A0710C (Micromechanical devices and systems); A4283 (Micro-optical devices and technology); A9555 (Astronomical and space-research instrumentation); B8380M (Microactuators); B2575F (Fabrication of micromechanical devices); B4145 (Micro-optical devices and technology); C3260P (Microactuators); C3120C (Spatial variables control); C3390M (Manipulators); C3380E (Control of astronomical instruments); C3380P (Control of optical systems)

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23/9/4
DIALOG(R)File 2:INSPEC

08033824 INSPEC Abstract Number: A2001-20-4260B-003, B2001-10-4320J-079
Title: Realization and performance of as-fabricated SGDBR multiwavelength laser arrays
Author(s): Ing-Fa Jang; San-Liang Lee; Chi-Yu Wang; Lih-Wen Lai; Wen-Jeng Ho; Yu-Heng Jan
Author Affiliation: Dept. of Electron. Eng., Taiwan Univ. of Sci. & Technol., Taipei, Taiwan
Journal: IEEE Photonics Technology Letters vol.13, no.9 p.933-5
Publisher: IEEE,
Publication Date: Sept. 2001 Country of Publication: USA
CODEN: IPTLEL ISSN: 1041-1135
SICI: 1041-1135(200109)13:9L.933:RPFS;1-V
Material Identity Number: M857-2001-010
U.S. Copyright Clearance Center Code: 1041-1135/2001/$10.00
Document Number: S1041-1135(01)07537-1
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: For simplifying the fabrication and operation of multiwavelength laser arrays, sampled grating distributed Bragg reflector (SGDBR) lasers are utilized to form the arrays, where the **two** SGDBR **mirrors** of each laser are fabricated on waveguides of different thicknesses. Fabrication of such laser arrays requires a single step of holographic exposure to realize the gratings. The lasers in an array can output wavelength combs of narrow wavelength spacing without the necessity of coarse tuning to the mirrors. We demonstrate monolithically integrated 16-wavelength laser arrays of which the wavelengths are **aligned** to the International Telecommunication Union grid with single-electrode operation. (8 Refs)
Subfile: A B
Descriptors: distributed Bragg reflector lasers; holographic gratings; integrated optics; laser mirrors; laser tuning; optical fabrication; optical transmitters; **semiconductor** laser arrays; wavelength division multiplexing
Identifiers: sampled grating DBR multiwavelength laser arrays; fabrication; sampled grating distributed Bragg reflector lasers; SGDBR mirrors; waveguides; holographic exposure; wavelength combs; narrow wavelength spacing; monolithically integrated 16-wavelength laser arrays; International Telecommunication Union grid; single-electrode operation; WDM ; tunable laser
Class Codes: A4260B (Design of specific laser systems); A4255P (Lasing action in semiconductors); A4280F (Gratings, echelles); A4280A (Optical lenses and mirrors); A4285D (Optical fabrication, surface grinding); A4282 (Integrated optics); A4280S (Optical communication devices); B4320J (Semiconductor lasers); B6260C (Optical communication equipment); B6260M (Multiplexing and switching in optical communication); B4140 (Integrated optics)

23/9/5
DIALOG(R)File 2:INSPEC

07789268 INSPEC Abstract Number: A2001-02-4280S-016, B2001-01-6260C-037

Title: Novel techniques for realizing SGDBR DWDM sources without coarse tuning

Author(s): Ing-Fa Jang; San-Liang Lee; Chi-Yu Wang; Tien-Tsorng Shih; Yu-Heng Jan

Author Affiliation: Dept. of Electron. Eng., Nat. Taiwan Univ. of Sci. & Technol., Taipei, Taiwan

Conference Title: Conference Digest. 2000 IEEE 17th International Semiconductor Laser Conference. (Cat. No.00CH37092) p.79-80

Publisher: IEEE, Piscataway, NJ, USA

Publication Date: 2000 Country of Publication: USA x+159 pp.

ISBN: 0 7803 6259 4 Material Identity Number: XX-2000-02453

U.S. Copyright Clearance Center Code: 0 7803 6259 4/2000/$10.00

Conference Title: Conference Digest. 2000 IEEE 17th International Semiconductor Laser Conference

Conference Sponsor: IEEE Laser & Electro-Opt. Soc

Conference Date: 25-28 Sept. 2000 Conference Location: Monterey, CA, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Experimental (X)

Abstract: The multi-wavelength transmitters for DWDM systems can be built with either multiple discrete lasers (DLs) or monolithically integrated multi-wavelength laser arrays (MWLAs). The output wavelengths of these sources must match a specified wavelength grid, so the critical issues of fabricating DWDM sources are wavelength accuracy and stability. We have demonstrated a simple approach for fabricating MWLAs using SGDBR lasers of which the sampling period varies from laser to laser. Arrays of 32 wavelengths with good wavelength uniformity and controllability have been demonstrated. However, the multi-wavelength output was achieved by tuning one of the **two** SGDBR **mirrors** to **align** the reflection spectra at their first order peaks. To simplify the wavelength control for each laser, we demonstrate here the laser arrays that can generate multiwavelength output without any current tuning. This approach may be even more advantageous for fabricating DL-type DWDM sources such that multiple wavelengths can be obtained from the same **wafer** to save the manufacture cost. The previous approach for fabricating DL-type sources is to vary the wavelength in the **wafer** scale, i.e., one wavelength from one **wafer** . (3 Refs)

Subfile: A B

Descriptors: distributed Bragg reflector lasers; integrated optics; laser beams; laser mirrors; laser stability; laser tuning; optical fabrication; optical transmitters; quantum well lasers; **semiconductor** laser arrays; waveguide lasers; wavelength division multiplexing

Identifiers: SGDBR DWDM sources; multi-wavelength transmitters; DWDM systems; multiple discrete lasers; monolithically integrated multi-wavelength laser arrays; output wavelengths; specified wavelength grid; wavelength accuracy; wavelength stability; fabricating; SGDBR lasers; sampling period; wavelength uniformity; wavelength controllability; multi-wavelength output; tuning; mirrors; reflection spectra; first order peaks; wavelength control; laser arrays; multiwavelength output; current tuning; multiple wavelengths; manufacture cost; **wafer** scale

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23/9/9
DIALOG(R)File 2:INSPEC

06592745 INSPEC Abstract Number: B9707-1320-015
Title: Fabrication of mm-wave undulator/linear accelerator cavities, using deep X-ray lithography

Author(s): Song, J.J.; Kang, Y.W.; Kustom, R.L.; Lai, B.; Mancini, D.C.; Nassiri, A.; White, V.
Author Affiliation: Adv. Photon Source, Argonne Nat. Lab., IL, USA

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2880 p.288-94
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1996 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1996)2880L.288:FWUL;1-Y
Material Identity Number: C574-96230
U.S. Copyright Clearance Center Code: 0 8194 2278 9/96/$6.00
Conference Title: Microlithography and Metrology in Micromachining II
Conference Sponsor: SPIE; Semiconductor Equipment & Mater. Int.; NIST
Conference Date: 14-15 Oct. 1996 Conference Location: Austin, TX, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)

Abstract: The possibility of fabricating mm-wave radio frequency cavities using deep X-ray lithography (DXRL) is being investigated. The frequency of operation can be from 30 GHz to 300 GHz, operating in either TM or TE-mode, depending on the application. For most applications, a complete structure consists of **two mirror** -image planar half structures assembled face-to-face. The fabrication process includes manufacture of precision X-ray masks, exposure of positive resist by X-rays through the mask, resist development, and electroforming of the final microstructure. A precision hard X-ray mask was made by means of a surface mask, using soft X-ray lithography for pattern transfer into poly-methylmethacrylate (PMMA) on a 200- mu m thick Si **wafer** , followed by electroplating of 35- mu m Au at CXrL (Center of X-ray Lithography) in Wisconsin. For the DXRL process, PMMA was used as the positive resist, either as a 1-mm sheet glued or a 200- mu m film cast onto a Cu **substrate** . The NSLS (National Synchrotron Light Source) X-26C beamline in Brookhaven was used to expose the resist. 99.9% OFC (oxygen free copper) was electroplated onto the developed PMMA structure, and then polished by diamond-lapping. The cavity is **aligned** with optical fibers on the grooves and then the initial test is performed with an HP8510 network analyzer. (12 Refs)

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25/9/1
DIALOG(R)File 2:INSPEC

07491937 INSPEC Abstract Number: B2000-03-7260F-025

Title: A proposal and a feasibility study of an interferometric display device

Author(s): Hatsuzawa, T.; Goto, T.; Oguchi, T.; Hayase, M.
Author Affiliation: P&I Lab., Tokyo Inst. of Technol., Japan

Journal: Transactions of the Institute of Electrical Engineers of Japan, Part E vol.119-E, no.12 p.631-5
Publisher: Inst. Electr. Eng. Japan,
Publication Date: Dec. 1999 Country of Publication: Japan
CODEN: DGREF9 ISSN: 1341-8939
SICI: 1341-8939(199912)119/E:12L.631:PFSI;1-#
Material Identity Number: F143-2000-001
Language: Japanese Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)

Abstract: A micro electromechanical element for a novel display device, the IDD (interferometric display device), has been proposed and a prototype device is tested to verify its actuation principle. In the IDD, a Fizeau interferometer is constructed by an SiO/sub 2/ half mirror and silicon **substrate** surface. When the **mirror** gap is **controlled** by electrostatic force to adjust the optical path difference between **two mirrors** , the contrast can be changed by the interference in the Fizeau interferometer. A prototype device with 100 mu m square mirror is driven by a DC voltage up to 50 V, resulting in a circular interferometric fringe movement observed by an optical microscope. Step responses less than 100 Hz are also examined by using a laser light source. (5 Refs)

Subfile: B
Descriptors: display devices; electrostatic actuators; light interferometry; mirrors; optical microscopy; step response
Identifiers: feasibility study; interferometric display device; micro electromechanical element; display device; IDD; actuation principle; prototype device; Fizeau interferometer; SiO/sub 2/ half mirror; silicon **substrate** surface; mirror gap; electrostatic force **controlled mirror** gap; optical path difference; image contrast; DC voltage; circular interferometric fringe movement; optical microscope; laser light source; step responses; 100 micron; 50 V; 100 Hz; SiO/sub 2/; Si
Class Codes: B7260F (Display equipment and systems); B2575 (Micromechanical device technology); B8380M (Microactuators); B5180D (Electrostatic devices)
Chemical Indexing:
SiO2 bin - O2 bin - Si bin - O bin (Elements - 2)
Si sur - Si el (Elements - 1)
Numerical Indexing: size 1.0E-04 m; voltage 5.0E+01 V; frequency 1.0E+02 Hz

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32/9/3
DIALOG(R)File 2:INSPEC

06631769 INSPEC Abstract Number: A9716-0760F-017, B9708-7320P-016
Title: Real-time monitoring and control during MBE growth of GaAs/AlGaAs Bragg reflectors using multiwavelength ellipsometry
Author(s): Wagner, T.; Johs, B.; Herzinger, C.; Ping He; Pinal, S.; Woollam, J.
Author Affiliation: L.O.T.-Oriel GmbH, Darmstadt, Germany
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3094 p.301-7
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1997 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1997)3094L.301:RTMC;1-I
Material Identity Number: C574-97092
U.S. Copyright Clearance Center Code: 0 8194 2509 5/97/$10.00
Conference Title: Polarimetry and Ellipsometry
Conference Sponsor: SPIE; State Committee for Sci. Res
Conference Date: 20-23 May 1996 Conference Location: Kazimierz Dolny, Poland
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Experimental (X)
Abstract: A new multi-wavelength in-situ ellipsometer acquiring accurate ellipsometric data at 44 wavelengths from 415 to 750 nm in less than 1s is directly mounted on a MBE growth system. Compared to single wavelength ellipsometers enough measured data are available to have access to layer thickness, composition, temperature and exact angle of incidence. In situ monitoring and real time analysis was used to control the process of GaAs/AlGaAs Bragg reflectors with a center wavelength of 1000 nm. The layer thickness is controlled very accurately even though ellipsometric data was acquired only every 3 seconds. The accuracy of the shutter timing can be made very precisely even for slow ellipsometric acquisition rates and substrate wobble due to MBE substrate rotation. The **control** algorithm for **two reflectors** did not attempt to **control** the Al composition of an individual AlGaAs layer, but the measured composition was used to adjust the Al cell temperature for the next AlGaAs layer. In comparison for **another reflector** , the FastDyn fitting routine were used to simultaneously control the thickness and surface composition of the AlGaAs lasers. An overview about the hardware and software integration on the MBE system is given. The in situ measurements during the growth control were later compared with ex situ measurements made with spectroscopic ellipsometer system VASE. (13 Refs)
Subfile: A B
Descriptors: aluminium compounds; ellipsometers; ellipsometry; feedback; gallium arsenide; III-V **semiconductors** ; mirrors; molecular beam epitaxial growth; optical fabrication; optical variables measurement; real-time systems; **semiconductor** growth

STIC Search Report
EIC 2800

Scientific & Technical Information Center
USPTO

STIC Database Tracking Number: 201593

TO: Tara Pajoohi
Location: ACAD
Art Unit: 2112
Wednesday, September 27, 2006

Case Serial Number: 10/821890

From: Paul Kim
Location: STIC-EIC2800
JEFF 4A-70
Phone: 571-272-8949

Email: paul.kim3@uspto.gov

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Technical Searcher

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What is the topic, such as the novelty, motivation, utility, or other specific facets defining the desired focus of this search? Please include the concepts, synonyms, keywords, acronyms, registry numbers, definitions, structures, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract and pertinent claims.

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Searcher: Paul Kim	Structure (#) ___	STN ✓
Searcher Phone: 2-8949	Bibliographic ___	Dialog ___
Searcher Location: STIC-EIC2800, JEF-4B68	Litigation ___	Questel/Orbit ___
Date Searcher Picked Up: 9/26/06	Fulltext ✓	Lexis-Nexis ✓
Date Completed: 9/27	Patent Family ✓	WWW/Internet ✓
Searcher Prep/Rev Time: 5 hr	Other ___	Other ___
Online Time: 6hr		